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SOVIET AND NAZI ECONOMIC PLANNING

IN THE 1930s

Peter Temin

No. 554

May 1990

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## Abstract

This paper argues that economic planning under Stalin and Hitler in the 1930s was essentially similar, both in process and outcome. Both economies had fixed prices and used coercion as part of a rather chaotic process of resource allocation; consumption in both countries was sacrificed to investment in heavy industry. Both economies can be thought of as socialist, and socialism in the 1930s was hardly more than military mobilization.

The economy of the Soviet Union is distinguished from that of capitalist economies by having both public ownership of property and centralized economic planning. This two-dimensional classification gives rise to questions about intermediate cases, particularly now that the Soviet economy is in the process of change. Economies with public ownership of property but not planning have been analyzed under the label of market socialism. Economies with private ownership and central planning have suffered neglect by comparison. The Nazi and wartime economies are mentioned occasionally as examples, but little attention has been paid to them in this context. (For example, Pryor, 1985, p. 24.)

This paper compares the process of economic planning in Nazi Germany and Soviet Russia in the 1930s. I argue that there were many similarities between planning in the two economies. The commonalities derived in large part from the use of fixed prices and economic coercion. Planning in the Soviet Union was less well organized and planning in Nazi Germany was more organized than might be thought.

Two implications follow from this finding. First, actual socialist planning in the 1930s was closer to military mobilization than the market socialism of Western theorists or postwar Yugoslavia. Although not a new view, this conclusion has dropped out of recent discussions of the Soviet economy and needs reemphasis (Gregory and Stuart, 1990). Second, the Nazi economy

shared many characteristics with the dominant socialist economy of the time. The National Socialists were socialist in practice as well as name.

The investigation will proceed in three steps. I will look first at the inputs to planning: bureaucracy, fixed prices, economic incentives. Then I will examine the major outputs of planning: the growth of output, its composition, and the standard of living. Finally I will attempt to infer the planners' aims from their activities as well as their statements. A concluding section reiterates some important differences between the Nazi and Soviet economies.

## I

Even the most superficial account of the 1930s notes the resonance between the Five Year Plans of Soviet Russia and the Four Year Plans of Nazi Germany. Despite their enmity toward Moscow, the Nazis followed the Communists' lead in multi-year planning.<sup>1</sup> They appropriated the label with only the smallest change to differentiate themselves. They chose to plan over a similar time horizon. And they created the same kind of specialized bureaucracy to administer the plans. This can be seen most clearly in the parallels between the Second Five and Four Year Plans, which were neither five nor four years long. They ran from 1934 to 1937 and from 1936 to 1938, respectively.

It is a mistake to think that the Soviets were in control of their economy, while the Nazis were not. Both economies were subject to the confusions that follow from implementing new and untried ideas. They were prey to the vagaries of large and

chaotic bureaucracies. In both countries, the planning organizations were created in the 1930s. The resulting administrations were expressions of confusion as much as of rationality.

Soviet planning had existed in theory since the Revolution, but it only became serious with Stalin's First Five Year Plan at the end of the 1920s. The abandonment of the New Economic Policy (NEP) put great strains on both the economy and on the organizations that were supposed to plan it. The Soviets continually reorganized the planning bureaucracy in the early 1930s to deal with the new problems. VSNKh (Vesenkha) had been the main administrative agency in the 1920s with branches and subsidiary organizations (Glavki) in regions and industries. VSNKh was abolished at the beginning of 1932 and replaced by three separate organizations, for timber, heavy industry, and light industry. The subordinate units then were reorganized and subdivided as well. The number of Glavki under the commissariat of heavy industry, for example, doubled in 1933.

The commissariat for light industry was subordinated to provincial authorities. But the other two commissariats retained independent authority. Enterprises in heavy industry consequently were subjected to dual authority--from the industry section of the central government and from the regional branch of the political apparatus. Enterprises were subjected to different kinds of control depending on whether they were classified as light or heavy industry. It could easily happen that similar enterprises would fall under different administrations and

therefore different lines of authority, "which makes regional as well as branch planning particularly difficult" (Zaleski, 1980, pp. 22-27).

In addition, Gosplan--the central planning, as opposed to operating, agency--was being purged. Starting in late 1930, political qualifications replaced technical ones for staffing Gosplan. Bourgeois specialists were replaced with the party faithful. And the party faithful were replaced in turn by even more faithful party members. District planning committees suffered similar fates. Almost half of their chairmen at the start of 1937 had been chairmen less than a year; only ten percent had been in place for three years. It was not a system that rewarded technical expertise or performance.

Only in 1934 were uniform planning indicators adopted, enabling Gosplan to compile data for the economy as a whole in a consistent manner. And as might be expected, the initial forms were seriously incomplete. The 1935 forms, for example, did not ask for data on net investment (to enable construction materials to be allocated), for complete costs (to show the need for financing), or for data that were comparable to past data. Only as experience was gained throughout the late 1930s was the scope of central planning extended throughout the economy (Zaleski, 1980, pp. 49-60). A Western visitor to Gosplan in 1936-37 argued that he did not get a coherent view of Soviet planning because "a coherent planning system did not exist. What existed was a priorities system of a fairly simple kind....The elaborate governmental procedure for drawing up the plans was, in

principle, the means of handling the Politburo's economic decisions while preventing the economy from breaking up" (Miller, 1964, p. 120, quoted in Zaleski, 1980, p. 66).

Since planning was loose and somewhat random, much of the economy functioned outside the plan. Officially recognized market transactions were used for many activities: material balances were only calculated for 105 commodities in 1934 (Zaleski, 1980, p. 98). Myriad other goods were allocated piecemeal by other agencies or by the market. In addition, enterprises dealt with the divergence between the plan and reality by reallocating materials among themselves by "blat,...the use of personal influence for obtaining certain favors for which a firm or individual is not legally or formally entitled" (Berliner, 1957, p. 182). Blat was used to obtain both centrally planned goods and market goods without queues. The market and underground economies were important parts of the resource allocation process.

This aspect of central planning emerged with planning itself; there was no lag. Enterprises in 1930 were using stocks of materials to barter with other enterprises. It was impossible to function without these exchanges. A contemporary report estimated that there were 2,500 provincial barter agents (tolkachi) in Moscow in 1930 (Davies, 1989, p. 485n).

The Nazi planning administration also was in a continual state of flux. Unlike the Soviet Five Year Plan, the Nazi Four Year Plan did not replace the previous administration of the economy. Instead, it was superimposed on an existing government

bureaucracy with which it competed for resources. It was not unusual among Nazi activities in having a new bureaucracy, headed by Herman Göring and composed largely of military men, to direct it. The new organization was a rival to the air force, also under Göring, the army and the economics ministry, all of which participated in economic planning and administration. Further complications came from delays in staffing the Four Year Plan. A secret strategy paper in 1938 acknowledged that the new bureaucracy was grossly understaffed and inefficient (Reichswirtschaftsministerium, 1937). Overlapping and confusing controls were a hallmark of socialist planning in the 1930s.

The extent of the Four Year Plan is shown in Figure 1, which shows the plan's organizational structure before a 1938 reorganization. It can be seen that the plan reached into most parts of the economy, although it focused on exploiting domestic supplies or creating domestic substitutes for raw materials. Other sectors, such as transport, were not included in the plan, but were part of the power struggle between the Four Year Plan and other branches of the government (Overy, 1984, p. 59).

The Four Year Plan was not as comprehensive as the Five Year Plan. The Four Year Plan consequently did not engage in material balancing. The composition of production was centrally directed through the capital market and the allocation of steel, but the Nazis did not try to anticipate inconsistencies between their various activities. Partly due to the incomplete coverage of the Four Year Plan, this omission also was a reflection of Nazi administrative chaos. Shortages did develop and had to be dealt



with through the plan.

The state did not own industry in Germany. It consequently needed to have a legal form with which to implement the plan. The Nazis signed long-term contracts with industry groups to buy their output at fixed prices (Hayes, 1987, pp. 118-19). These contracts were nominally contracts expressing agreement by both parties. But the two parties were decidedly unequal. The Nazis viewed private property as conditional on its use--not as a fundamental right. If the property was not being used to further Nazi goals, it could be nationalized. Professor Junkers of the Junkers airline plant refused to follow the government's bidding in 1934. The Nazis thereupon took over the plant, compensating Junkers for his loss (Nuernberg Military Tribunals, 1953, Vol VII, p. 416). This was the context in which other contracts were negotiated.

A more prominent and important exception to the rule of private property was the Hermann Göring Works, established in 1937. (They employed over half a million workers by 1941.) The motives for establishing this group of government-owned enterprises were varied. Göring wanted to increase the domestic supply of goods to further Germany's autarky, to keep prices down by increasing competitive pressure on private industry, and to add credibility to his threats to nationalize companies. Take-overs, like the Junkers airline plant, and threats of take-overs were used to encourage compliance with government production plans. When a major steel company, Gutehoffnungshütte, refused to use low-grade domestic ores because they were not profitable,

Göring threatened to incorporate parts of the firm into his Works. Domestic low-grade ores were to be used to promote the Four Year Plan's goal of autarky, even at the expense of private profits, whoever owned the plants (Wirtschaftsgruppe Eisenschaffende Industrie, 1937).

Centralized control of agriculture was a prominent feature of both economies. Soviet planning in the 1930s was dominated by the experience of forced collectivization in agriculture. NEP foundered in the late 1920s on the inability of the state to get the grain it needed from independent peasants. Stalin returned to the techniques of War Communism, forcing the peasants into collective farms and coercing the desired output from them.<sup>2</sup>

Agriculture therefore was within the scope of government control. Land could not be bought or sold; the bulk of output could not be sold except through the government. (Peasants did retain small private plots whose output could be sold privately.) The scope for individual decisions by agricultural producers was very small.

The story in Germany reveals a similar centralization of control, but without the disruption of collectivization. Agriculture was within the scope of the Four Year Plan, as shown in Figure 1. In order to tie farmers to the land, the Nazis prohibited the sale of agricultural land (Petzina, 1968, pp. 91-96). In order to maintain stable prices and still control production, marketing boards were given monopoly rights to agricultural output. There were quotas for delivery of specific products to the marketing boards at fixed prices. The boards

served to keep prices up at the depth of the Depression when lack of demand (and a good harvest in 1933) threatened farm incomes. The boards then kept farm prices down during the industrial expansion of the middle 1930s (James, 1986, p. 357). While farm ownership remained nominally private, the ability to make decisions and to claim the residual income was taken away. Ownership in the sense of having discretion over operations was put into escrow (Grossman and Hart, 1986).

Despite the nominal difference between public and private ownership, the state's control over agriculture was similar in the two countries. In both cases the state took control over prices, quantities and the access to land. And in both countries agricultural problems were among the most troublesome obstacles to fulfillment of the multi-year plans (Petzina, 1968, p. 96). The differences between Nazi and Soviet forms should not blind us to the similarity of functions. The short-lived nature of the Nazi regime, after which farms reverted to the private economy, also should not confuse us. After all, it now seems likely that Soviet farms will revert to what passes for private ownership in Russia as centralized planning is abandoned.<sup>3</sup>

Soviet planning was based on the concept of "permanent prices." Prices were set to equal costs in good Marxian fashion. They then were to be kept fixed in order to simplify both planning and consumption. This had two consequences. First, as every student of Soviet planning knows, prices could not be used to allocate resources. Quotas and targets were the tools of Soviet planning. Second, prices soon began to deviate from

costs. Soviet planners were happy to let prices fall below costs in some industries as an incentive for technical change. For example, they kept prices on materials low, making up the difference with subsidies. But the subsidies produced budget deficits instead of innovations, and the Soviets slowly began to realign prices with costs in 1936. Interrupted by the Second World War, the price reform was completed only twenty years later (Berliner, 1988, Chapter 10).

The Nazi economic program also was based on constant prices. In order to maintain price stability the Nazis began by directly specifying individual prices. Agricultural prices, as noted above, were kept from falling in 1933-34 in response to the large harvest and international supplies and from rising after 1935 when scarcities emerged. Changes in costs resulted in taxes and bonuses to stabilize the returns to producers, not changes in wholesale or retail prices. Publicity to alter consumption patterns and rationing if necessary were used to deal with changes in product availability (Guillebaud, 1939, pp. 161-65).

Industrial prices had been controlled under Brüning after the deflationary decree of December, 1931. A Commissioner for the Supervision of Prices was created to oversee the mandated price reductions. The Commissioner was fired by the Nazis and then reappointed to deal with the threat of inflation. Echoing Soviet practice in the 1920s, business enterprises were encouraged to join cartels--like the Wirtschaftsgruppe Eisenschaffende Industrie--in order to ease the job of regulating them. But the controls did not work well at first. At the start

of the Second Four Year Plan, a new Commissioner was appointed who quickly prohibited all price increases over the level of October 17, 1936, in the famous Price Stop (Preisstop) Decree (Reichskommissar für Preisbildung, 1936; Guillebaud, 1939, pp. 166-73).

The Nazis maintained that price controls--indeed all economic controls--were not to last forever. The Price Commissioner himself stated that one of his guiding principles was the temporary nature of the controls (Guillebaud, 1939, pp. 177, 223). This attitude contrasted with the Soviet ideal of permanent prices; the Soviets kept prices constant as a matter of principle; the Nazis, as a matter of expediency.<sup>4</sup> This may have created some differences in long-range planning, of which more below, but it did not matter for short-run resource allocation. Statements of future intention were far less substantial than the enforced regulations.

In both countries, therefore, another means of resource allocation had to be found. In a market system, prices move to guide resources into uses, both in production and consumption. Fixed prices clearly could not fulfill this function. Profits also lost their allocative function, as profits based on fixed prices do not carry the information of profits with market prices. Both economic systems therefore eliminated profits as an indicator of desirable investments.

Other means had to be found to allocate resources. The Five and Four Year Plans set quantity goals for firms and enterprises. Soviet quotas are well known. The Nazis also set quotas for many

industrial goods, including pig iron, steel, aluminum, magnesium, gun powder, explosives, synthetic rubber, all different kinds of fuel, and electricity (Reichsamt für Wirtschaftsaufbau, 1944). More detailed Nazi material allocations can be seen in the expansion of mining capacity at the Deckenbach mine in the Ruhr. An initial proposal was sent to the Four Year Plan in 1937. The matter was referred to the Office of German Resources and Materials which issued an allocation order on a standardized form. The order specified the type and quantity of steel the mine could acquire. The control number gave the priority of this allocation to the supplying steel company. Standardized allocation orders existed also; the materials for a new steel plant, for example, were calculated from the new plant's anticipated capacity (Reichsamt für Wirtschaftsaufbau, 1937b).

The use of material balances solved one problem at the expense of creating another. It was not sufficient to require an enterprise to produce a certain quantity; the managers of enterprises had to be convinced to fulfill the goal. Recent research on American firms has emphasized discrepancies between incentives for the enterprise and for its managers (Holmstrom and Tirole, 1989; Raff and Temin, 1990). The same problem existed in more acute form in Nazi Germany and Soviet Russia in the 1930s. The solution can be uncovered by looking first at the enterprise level and then at managers.

Under the Nazis, the interest rate was stabilized at 4.5 percent and dividends were limited to six percent. There was excess demand for credit at these rates, and banks and the stock

market lost much of the ability to direct resources into alternative uses. "In place of the ordinary profit incentive to investment in a free economic system, there has been a careful and thorough regulation which [allocated] investment in accordance with its importance for the needs of the State" (Guillebaud, 1939, p. 217).

Government financing came to dominate the investment process. The government issued both official government bonds and off-budget procurement bonds ("Mefo" bonds) to finance their desired investment. The proportion of private securities issued fell abruptly from over half of the total in 1933 and 1934 to around 10 percent in 1935-38 (Schweitzer, 1964, p. 463). Retained earnings provided an alternative source of funds for some firms, although heavy profit taxes limited the use of this form of financing. The largest firms, however, were mostly exempt from profit taxes, giving them a measure of independence (Reichswirtschaftsministerium, 1937). Government control was extensive enough to leave "only the shell of private ownership" (Woolston, 1941, p. 3).

The Soviet government furnished capital free to enterprises, subject only to a small capital depreciation charge. Eschewing the discipline of price, the Soviets needed to allocate capital directly to industries and enterprises. This bureaucratic process was even more chaotic than its German counterpart.

Faced with a zero price, enterprises asked for as much capital as they thought they could handle. Knowing that, planners routinely reduced the requests by as much as 30 or 40

percent. No enterprise could avoid inflating its requests; no planning authority could neglect its obligation to cut them. As Zaleski noted, "There is no reason at all why the estimation of needs made in this manner should produce a coherent solution" (Zaleski, 1980, p. 78).

The Soviet government also taxed away most profits. The principal tax was a turnover or sales tax which hit all industrial enterprises alike. In addition, there were heavy taxes on profits to keep enterprises from accumulating capital under their control. The planners decided which industries and enterprises should expand and then provided them with resources. They did not want independent decisions about investment.

It has become a truism in the study of American business firms that the interests of the firm and of its managers may not coincide. This divergence was understood well by both the Nazis and the Soviets. In addition to the direct allocation of investment resources, both governments provided incentives for managers to use them in accordance with the state's interests. In both systems, the incentives were positive and negative, both carrots and sticks.

The carrots in each case were monetary payments. Managers in Germany could be paid salaries and could receive the limited dividends on the capital they owned. Bonuses provided rewards for able management. They were set by firms and did not always reward behavior in accord with government plans. Managers in the Soviet Union also received bonus for fulfilling plan targets. These payments provided incentives, but not always for the



desired actions. Since the plans were drawn in terms of quantities, the bonuses were awarded on the basis of quantities produced. This provided little reward for quality and even less for innovation (Berliner, 1976).

If salaries and bonuses provided carrots, terror furnished the stick in both Germany and Russia. Used selectively, these negative incentives were capable of targeting the desired behavior quite precisely.<sup>5</sup> As the positive rewards were less closely tied to specific performance in Germany, we would expect the negative rewards to be more firmly anchored. The harshness and apparent randomness of repression in both countries has been widely noted. But its economic effects have not been fully appreciated.

Terror, like managerial compensation, operated directly on business executives, not on the business enterprise as a whole. Stalin's celebrated purges included economic leaders. Engineers and industrialists were among the first victims of purge trials in 1928 and 1930 (Zaleski, 1971, pp. 106-09). These men were not politically active. They had been doing their jobs, supervising and planning economic activity. They were at risk because of their economic position. They were being punished because they dared to use their expertise to make independent judgments, to second guess the central planners.

The trials were heavily publicized. Everyone could see the public humiliation and punishment of the business leaders. No one could fail to be cowed by the threat of similar treatment. Continuing well-publicized purges kept the danger and its

perception alive. The best way to avoid this fate was to follow orders as faithfully as possible, to conform with directions from the political administration. The threat of denunciation was a powerful enforcement mechanism for economic plans.

The Nazis also used terror as an instrument of state policy. Historians have detailed the violence against Jews and other groups. But this was not the whole of the Nazi program. Terror was also used to control groups and organizations central to German society and economy. Hitler is supposed to have told Schacht, "The primary cause of the stabilization of our currency is the concentration camp" (Hayes, 1987, p. 380). The standardized allocation form described above included penalties for noncompliance. It declared that, "Acquiring materials except for Four-Year Plan purposes will be regarded as economic sabotage." Under Nazi rules, this language threatened death or a concentration camp for any manager who pursued his own ends (Reichsamt für Wirtschaftsaufbau, 1937b).

The experience of I. G. Farben, one of the largest industrial companies in Germany, provides a vivid example. As Peter Hayes recounts the story, the Farben's leadership was drawn into the Nazi net by the use of selective terror against the firm and its executives. Very rapidly, in April, 1933, the Nazis intervened in Farben's activities. Hayes concludes that, "the first eighteen months of Nazi rule...established that in the Third Reich, for individual businessmen and everyone else, 'terror was the greatest of political realities'" (Hayes, 1987, pp. 94, 122-24).

Terror was still a potent reality for I. G. Farben in 1939, at the probable zenith of its influence. The head of one of Farben's three divisions (Sparken) was alleged to have said to a visiting group of party officials that Hitler and Göring, "were not sufficiently expert to be able to judge something like this, and it is shocking that a man [named] would fool them in this matter." The Farben executive was denounced to the Gestapo, threatened with a trial and possible prison sentence for saying "untrue or grossly distorted statements" about the party's leaders. He was subject to lengthy interrogation at the Gestapo office and had to petition the local Nazi Kreisleiter for permission to call on him and apologize. The Nazi Gauleiter reprimanded him and said he could not protect him again from more serious consequences (Hayes, 1987, pp. 202-03).

Hayes details the interaction between the company and the government without many references to political terror. But the use of terror to enforce conformity with Nazi economic policy was an underlying reality throughout the Nazi regime. While financial considerations and business contracts may have been the common coin of economic plans, terror provided the ultimate incentive for agreement and compliance.

One final point of similarity between Nazi and Soviet policies should be noted, although its meaning is far from clear. Both governments reorganized industry into larger units, ostensibly to increase state control over economic activity. The Nazis reorganized industry into 13 administrative groups with a large number of subgroups to create a private hierarchy for state

control. The state therefore could direct the firms' activities without acquiring direct ownership of enterprises. The preexisting tendency to form cartels was encouraged to eliminate competition that would destabilize prices (Guillebaud, 1939, p. 55).

The Soviets had made a similar move in the 1920s. Faced with a scarcity of administrative personnel, the state encouraged enterprises to combine into trusts and trusts to combine into syndicates (Gregory and Stuart, 1990, p. 61). These large units continued into the 1930s where they were utilized to bridge the gap between overall plans and actual production.

The state therefore directed the internal organization of industry in both countries. The creation of these industry groups allowed private organizations to control more of the hierarchy in Germany. It enabled enterprise-related hierarchies to do the same in Soviet Russia. Even though the Russian managers were not private, there seems to have been enterprise-specific knowledge that made lower-level hierarchies preferable to state bureaucrats in the administration of economic plans. The nature of this information asymmetry appears to have been independent of ownership patterns.

## II

A comparison of outputs of the two systems is considerably harder than a comparison of the inputs. There are myriad problems. The two most serious involve the choice of time period and of base period for price deflation.

The Soviet Union and Germany both experienced severe falls in output during the Depression, reaching bottom in 1932 or 1933. But the nature of the declines and their relation to politics differed. The German depression was a collapse of industry, while the Russian famine was an agricultural disaster. The Nazis also took power at the depth of the Depression, while the Soviets destabilized their agriculture by collectivization. The recoveries were more comparable. Both economies experienced a remarkable period of growth for a few years, after which they began to be entwined with preparation for and conduct of the Second World War.

There are two possible starting points. We could start in 1933, at the depth of the depression and at the start of the Nazi regime. This has the benefit of showing a homogeneous period of growth under a solitary policy regime. It has the defect that much of the growth of income involved the reutilization of idle resources and therefore combines recovery with the effects of economic planning.

Alternatively, we could start in 1928, at the previous peak of income and at the start of Soviet planning. This has the advantage of cyclically comparable beginning and end points. It has the defect that the Nazis were not responsible for the German depression while Stalin certainly was responsible for the Soviet suffering in the early 1930s. Since more data are available for this benchmark--particularly for the Soviet Union--it will be the primary focus here.

The ending point needs to be in the late 1930s to avoid the

war. Bergson's data for the Soviet Union are available for 1937; Hoffmann's data for Germany, for 1937 and 1938. These seem like the logical stopping points. Growth until then shows the effects of the first generation of plans. The Soviet Union was at the end of its Second Five Year Plan. Nazi Germany was in the midst of its Second Four Year Plan.

The question of deflators is important but intractable. Hoffmann compiled his index of German NNP at 1913 prices because he was interested in the origins of German industrial growth in the mid-eighteen hundreds as well as more current concerns. Bergson used 1937 "prices" for his index of Soviet NNP and GNP because he was investigating the Soviet economy, which did not come into existence until after 1913. Neither Hoffmann nor the Soviet sources provide enough information for the estimates to be reweighted on a common base (Hoffmann, 1965; Bergson, 1961).

German real NNP was 45 percent larger in 1938 than in 1928. Soviet real NNP was 49 percent higher in 1937 than in 1928 (Hoffmann, 1965, p. 828; Bergson, 1963, p. 36). These respectable growth rates--spanning the intervening depression--are virtually identical. The similarity, however, is a bit deceptive. Index number problems and the lack of precision of our estimates make these comparisons only approximate. If German growth is calculated to 1937, it is lower; if Soviet growth is calculated in 1927 prices, it is higher. We can say confidently that both countries had easily surpassed the level of income they had achieved on the eve of their great downturns. The extent of the gain--although similar--is hard to pin down.

Consumption, however, had not kept pace. Real per capita consumption in Germany was only about five percent above its 1928 level in 1938 (two percent in 1937) (Hoffmann, 1965, pp. 174, 828). Real per capita consumption in the Soviet Union was three percent below its 1928 level in 1937 (Chapman, 1963b, pp. 236-38). In other words, the growth in income was not reflected in a comparable rise in consumption.

Despite the similarity in per capita consumption, the story for real wages was quite different in the two economies. Real wages in Nazi Germany were almost the same in 1937 as in 1928 (Bry, 1960, p. 362). The constancy of consumption was the result of the stability of real wages. Real wages in the Soviet Union, by contrast, had fallen dramatically between 1928 and 1937. Using 1937 prices as the base, real wages in the later year were only about 60 percent of their previous level. The stability of consumption was only achieved by increased effort, which translates into high participation rates by women in Soviet Russia (Chapman, 1963a, p. 147).<sup>6</sup>

Where did the extra production go? Table 1 provides some of the answer. The similarity of format for Germany and the USSR requires some comment. Hoffman calculated NNP for Germany. I needed to estimate GNP in order to have data comparable to the GNP data for the USSR. I assumed that capital consumption was nine percent of GNP. This ratio was typical of the U. S. economy at the time, and may be taken for the German economy as well. Bergson disaggregated the Soviet economy into the sectors shown. The "government" sector was taken to be the sum of communal

services (primarily health and education), government administration, and defense (as recorded in the Soviet budget). Investment included fixed investment, changes in inventories, and agricultural investment (Bergson, 1961, pp. 62-83).

The first panel reveals that the German economy was considerably more industrial than the Soviet in 1928. Investment and government services were both twice as large relative to GNP as in the Soviet Union. As befits a more agricultural economy, consumption accounted for over 80 percent of Soviet GNP.

As noted above, GNP grew rapidly in both countries over the next nine years after an initial decline. The change from 1928 to 1937 can be divided into the same categories as 1928 income. The shares were very different, as shown in the second panel of Table 1. The marginal allocation of resources was far different than the average. In both countries, consumption accounted for a much smaller part of the change in GNP than it did in 1928 GNP. Per capita consumption, as noted above, was stagnant.

Both investment and government expenditures accounted for a larger share of the increase than of the base. In both economies, the share of government expenditures in the change in GNP was five or six times as large as its share in 1928 GNP. In the Soviet Union, investment's marginal share also was four times as large as its average.

The result is shown in the bottom panel of Table 1. The composition of GNP was almost identical in the two countries by 1937. Consumption had fallen to three-fifths of GNP, while investment and government each had risen to about one-fifth.



This was, of course, a much bigger change for the Soviet Union than for Germany. But it is noteworthy that the planning of the mid-1930s had drawn the two economies in remarkably similar directions. On the assumption that this was no accident, the similarity of results suggest similar aspirations.

The similarity between the two economies can be shown more precisely by looking at the cornerstone of industrial production, the iron and steel industry. Planning in both countries channeled resources toward iron and steel to increase their production. The results are shown in Table 2. Taking 1933 as the base, the two countries look similar indeed. The iron and steel industries are roughly the same size in both countries and exhibit the same rapid growth, more than doubling production in both countries. The rapid growth in Germany however was partly due to the preexisting size of the industry. Using 1928 as the base reduces the rate of growth of production in Germany to half the Russian rate.

### III

Having looked at inputs and outputs, it is time to examine the goals of planners in both countries. A recent account of the Soviet transition in 1930 by Davies, one of the most knowledgeable and erudite historians of interwar Russia, concludes that the motives behind Stalin's collectivization and turn toward intensified planning are not clear. After discussing a variety of factors, he states, "Historians have not yet satisfactorily assessed the relative importance of these various influences in determining the complex of decisions which led to

the transformation of the Soviet system at the end of the 1920s" (Davies, 1989, p. 464).

I cannot promise further analysis of the debates here. Instead, the statements utilized by historians will be combined with the evidence of their actions to infer aims. Statements have been the traditional source, but they need to be supplemented by deeds. On the assumption that political leaders were at least partially successful in realizing their goals, then the effects of planning should provide clues toward these goals. No definitive answer is possible, as Davies says, but this approach provides a way to synthesize some apparently unrelated utterances and actions.

Look first at the results of the economic policies in both countries. As noted above, per capita consumption did not increase more than a few percent in either country during the recovery from the Great Depression. Prices, taxes and profits were controlled in both countries to this end. This freezing of consumption levels therefore appears to have been a desired result of economic policies, not the unintended result of natural disasters or miscalculations. Forced collectivization involved both types of events, and they explain in part the low growth of consumption in the U.S.S.R. But, as shown in Table 1, the recovery from the low point of 1932-33 was not allocated to consumption. It follows that the maximization of consumption was not a primary aim of the planners.

It is more accurate to see current consumption as a constraint on the planners' actions rather than an element in

their objective function. This is one message of the Soviet industrialization debate of the 1920s. Whatever the ultimate aim of industrialization, Bukharin and Preobazhensky were grappling with the question of maintaining consumption levels during the process (Erllich, 1960). At some future time, western observers have always assumed, there would be a worker's paradise along the lines laid out by John Stuart Mill. But this future prospect, even if present in the minds of Soviet planners, was not much in evidence in the plans or the performance of the 1930s. The utopian goal of the Soviets was the analog of the Nazi view that controls were temporary.

The goal of Soviet planning was defined in terms of production rather than consumption. It was to maximize the production of heavy industry. This could be an end in itself, but production is not normally part of a utility function. It is a proxy for something else or a means to some other end. If production was indeed the means to an end, and the end was not consumption, then there must be another goal.

The primary goal was military. The Bolsheviks and particularly Stalin were afraid of attack from the West. They had reason to fear such an attack, having fended off one such assault a decade earlier. War hysteria provided some of the energy behind the massive reorientation of the Soviet economy. And, of course, war fears grew in the late 1930s as the generalized fear of western hostility was replaced with the specific alarm over an anticipated attack from Nazi Germany.

Leaders in both countries were aiming to restructure society

into a utopian vision. They were opposed to capitalism and formal markets. The Soviets wanted to create a socialist society without money, in which people would be rewarded directly for work. The Nazis wanted to restructure an already industrialized economy to create a new alternative to both the existing Western economies and the emerging Soviet one (Davies, 1989, pp. 477-78; Hardach, 1980, p. 66).

In the shorter run, however, leaders of both countries sounded a different tune. The Soviets had lived through a civil war, and they were frightened by the defeat of the Chinese communists in 1927. The Soviet Party Congress in December, 1927, resolved that industrial development had to be tailored to the needs for defense. Stalin summarized the results of the First Five Year Plan in 1933. He listed six tasks of the plan. The list started with a general summary: "to transfer our country, with its backward, and in part medieval, technique, to the lines new, modern technique." It ended more specifically: "Finally, the task of the Five-Year Plan was to create in the country all the necessary technical and economic prerequisites for increasing to the utmost the defensive capacity of the country, to enable it to organize determined resistance to any and every attempt at military intervention from outside, to any and every attempt at military attack from without" (Stalin, 1933).<sup>7</sup>

This line of policy was ever-present in political debates, but it did not mean that Russia was to become instantly a garrison state. Stalin derided a request for more military spending in 1930, saying that it would "militarize the whole

country and this was worse than any wrecking." The official statements stressed the goal of rapid industrialization more than an explicitly military approach (Davies, 1989, Chap. 12).

Nazi aims were even clearer than Soviet. They were interested in the military domination of Europe from the start. They did want to become a garrison state. The only doubt about their aim was created by the need to hide military expenditures initially to honor Germany's obligations arising out of World War One. As their tenure in office increased, the Nazis were increasingly able to articulate their aims and then to put them into practice. Hitler's famous Denkschrift stated bluntly that military and political rearmament had to determine the economic agenda. Autarky was to be promoted for defense, not for profit. This order of priorities was clearly articulated to party leaders in September, 1936 (Petzina, 1968, pp. 48-53).

The extent of military production in the 1930s clearly differentiates these two economies from all others. The Nazis were rearming as fast as they could. And a recent survey of preparations for war concluded that, "Only the Soviet Union had applied resources to rearmament on anything approaching the German order of magnitude" (Harrison, 1988, p. 173). The Soviet economy, partly in response to this Nazi thrust, was increasingly oriented to military ends during the 1930s. Defense spending rose from one to six percent of GNP between 1928 and 1937, accounting for a full fifteen percent of the increase in GNP (Bergson, 1961, p. 48).

Some comparative data are shown in Table 3. They show

clearly that Nazi Germany and the Soviet Union were in a class by themselves in military spending during the 1930s. As noted above, this spending was motivated in part by hostility between the two countries. But even before the Nazis became a visible threat, the Soviets--or at least Stalin--felt the need of military power to preserve the revolution.

The expenditures shown in Table 3, of course, include only the final stage of armaments production; the steel, machinery and construction that supported them were counted elsewhere in the growth of investment. The promotion of heavy industry, particularly steel production, was a prominent feature of both economies. (See Table 2.) And other industries nominally aimed toward consumer goods were in fact part of military preparation. Capital for the Volkswagen works in Germany was raised in part from workers who were given advance rights to purchase the cars. But before the cars could be produced, the factory was redirected at the start of the war to the production of lightweight, standardized military vehicles (Stolper, Häuser, and Borchardt, 1967, p. 152).

This account raises an interesting question. If the aim of Soviet and Nazi leaders was to allocate massive resources to the military, couldn't they have effected this reorientation of the economy within a market setting by a combination of taxes and subsidies? Consumption would be held down by heavy taxes; heavy industry and military production would be encouraged by tax abatements or direct subsidies. This is the question of the Soviet industrialization debate in the 1920s.

The answer is twofold. At the theoretical level, it makes more sense to regulate quantities when the costs of a quantity shortfall are great or the marginal costs are flat (Weitzman, 1974). Military procurement often is used as an example of this phenomenon because the loss from having an inadequate quantity of military might is very large, and costs are flat enough that price signals might not elicit the desired amount. At the practical level, the taxes required to channel all of the increase in per capita income into heavy industry and war preparation would have been heavy indeed. They would have been very costly to administer. In fact, they probably would have aroused enough hostility to make coercion necessary. The Soviets had already had unhappy experiences with peasant resistance. Better, even a policy maker less dedicated to coercion as a means of political control than Hitler or Stalin might have decided, to impose coercion at once and avoid the disruption of public protest.

Both systems used taxes and subsidies as part of their direction of the economy. But taxes and subsidies were not enough to do the job. They had to be supplemented by coercion. The Nazis allowed enterprises more freedom to respond to financial incentives and could use terror more selectively as a result. The Soviets targeted managers with bonuses, but had to supplement them with wholesale punishments to keep people in line. Or maybe the Soviets did not have to use this much terror; it was Stalin's paranoia that took control.

Whether or not the means were optimal, the end was clear.

As one contemporary commentator on the Nazi economy said: "Not in economic planning to raise the level of income for the enrichment of the people but in economic regimentation for military victory is to be found the distinguishing characteristic of the Nazi economy" (Woolston, 1941, p. 4). Distinguishing, I have argued, from Western but not from the other major socialist economy of its time.

#### IV

Having shown that the inputs, outputs, and aims of socialist planning in Nazi Germany and Soviet Russia during the Second Four and Five Year Plans were similar, it remains to note some of the differences between the two economies. While significant, these contrasts do not negate the common elements of socialist planning.

The first difference is that private property was virtually nonexistent in the Soviet economy and preserved by the Nazis. As noted above, the rights of private property were severely circumscribed in Germany. Both discretionary authority and current rewards were limited. But the ownership of productive assets was still vested in private hands in Germany and the state in Russia.

I have argued in Section II, above, that this difference was not important to many decisions. The incentives for managers--both positive and negative--were very similar in the two countries. Their responses to the plans consequently were similar as well.



There was one class of actions, however, in which the change in property ownership undoubtedly had an effect. They were the decisions whose effects would be seen only after some years delay. Actions with immediate effects were rewarded or punished immediately. But what was the incentive for a manager to engage in an activity that would bear fruit only with a lag?

Think of the state as principal and the enterprise manager as agent. The principal can structure the relationship between them to attract agents and induce them to fulfill the plan. But the principal can only reward actions that have their effects within the time span that the agent stays on the job. And he may be restricted as well in the rewards that he can offer if the agent does not stay on the job for a while.

The first constraint was binding in the Soviet Union since managers typically spent only about three years at any single post. The political conditions were such that managerial job stability was practically nonexistent (Berliner, 1976). Yearly targets were effective goals in this setting, but innovative activity that would have effects at future times was discouraged. More precisely, there was no incentive to undertake research or development that would yield its fruits more than a very few years down the line.

This critique of the Soviet system is now well known. But its application to the 1930s should not be exaggerated. The task of the Soviet system was to imitate the advanced technology of the West. This was a kind of innovation, but one whose outlines could be foreseen. Short-term goals could be set by planners to

achieve long-run goals. The impressive technological progress of Soviet heavy and armaments industries were the result. The annual rate of growth of total factor productivity growth in the Soviet Union from 1928 to 1940 was a respectable 1.7 percent annually (Ofer, 1987, p. 1778).

Germany was not doing that much better. Total factor productivity grew at 2.5 percent annually, which seems in keeping with Germany's long-run progress (Hoffmann, 1965, pp. 205-06, 254, 828).<sup>8</sup> But James speculated that the long-run effects of Nazi policies would not have been very different than the Soviet picture in the absence of a war: "a society with low wages and high savings ratios manufacturing ever cheaper and shoddier goods" (James, 1986, p. 417).

Not only couldn't the Soviet system reward actions that had effects beyond a very short time horizon, it was also restricted in the prizes it could bestow. Sizable bonuses were given for plan fulfillment and overfulfillment, but they could not compare with the share of equity that a manager in Germany could acquire. Berliner reported that Soviet managers in the 1970s claimed that larger bonuses would have little impact because there was nothing to spend them on. The existing bonuses allowed successful managers to eat and dress well, buy cars, travel (in the Communist world), and educate their children. There was nothing else to buy.

In Germany, by contrast, managers whose current earnings were restricted could get options on future earning power in the form of equity ownership. They had the ability to amass

considerable legacies for their children. To the extent that people work to earn bequests as opposed to consumption during their lifetime, the two systems were very different.

The elasticity of innovation with respect to these opportunities is not known. Berliner was reluctant to attribute the recent doleful Soviet performance to this factor, admitting only that it was a possibility (Berliner, 1976). We may speculate, therefore, that this difference had its primary effect on the stability of relative income groups--on the preservation of a German industrial oligarchy--and only a secondary effect on the aggregate economy in the 1930s. Over a longer period of time when innovation would be more important or after the Soviet Union brought its industry closer to the western level, the different incentives would be more important.

The second difference between the two economies was in their initial level of industrialization. As noted by every Bolshevnik theorist and shown in Table 1, the Soviet Union was far less industrialized than Germany. This meant that the structural change needed to get to the position of 1937 was greater in the Soviet Union than in Germany. It also meant, as just noted, that the innovation needs of the two economies were different.

This contrast therefore offset in part the effects of the first difference. Ownership was not as important to the Soviet economy in catching up to Western Europe. It may well have become more important after the Second World War, but the mobilization efforts of the 1930s were compatible with public ownership.

The third difference that needs to be noted is the starting point of the two regimes. Stalin caused the Russian famine by forced collectivization; Hitler was the product of a depression he did not cause. Soviet planning was more destructive of consumption than Nazi policies. The more explicitly socialist regime was the harshest on living standards.

These differences therefore need to be noted, but they do not vitiate the comparisons made in this paper. Socialist planning in both Nazi Germany and Soviet Russia in the 1930s was primarily a means for military preparation and mobilization. Consumption was a constraint on military and related expenditures, not a goal in itself. Socialism in the 1930s was far from benign. Its goal was national power, not the welfare of ordinary workers.

## Footnotes

- (1) Lenin had earlier followed the German concepts of economic control in World War One. Zaleski, 1971, p. 14.
- (2) Stalin, of course, could only determine the share of output going to the state. The peasants retained control over total production, with disastrous results.
- (3) Individual farm ownership was only introduced at the start of the twentieth century by Stolypin. (Gerschenkron, 1962).
- (4) Göring even considered abandoning planning in 1937 when steel production fell far short of the various quotas for its use. A draft decree to that effect survives in his files (Reichsamt für Wirtschaftsaufbau, 1937a).
- (5) Like frequent flyer programs today, terror could be aimed at the individuals making decisions.
- (6) In 1928 prices, the fall in real wages was less, and per capita consumption rose by about 20 percent.
- (7) Erlich (1960), p. 180, argued that a primary task was to defend against attack from within, to extend the totalitarian state rapidly over the whole society.
- (8) I assumed that workers would have received 70 percent of income in a competitive world.

Table 1

## Shares of GNP and of the Change in GNP

(Percent; constant prices)

	Germany	USSR
--	---------	------

1928

C	69	83
I	20	10
G	11	6

1928-37

C	15	19
I	32	41
G	50	39

1937

C	56	61
I	23	21
G	20	18

Source: Bergson, The Real National Income of Soviet Russia, p. 48; Hoffmann, Das Wachstum der Deutschen Wirtschaft, p. 828. German GNP was calculated as 1.1(NNP).

Table 2

## Iron and Steel Production, 1928-38

(millions of tons)

Year	Pig Iron		Crude Steel	
	Germany	USSR	Germany	USSR
1928	11.8	3.3	14.4	4.3
1929	13.2	4.0	16.1	4.9
1930	9.7	5.0	11.4	5.9
1931	6.1	4.9	8.2	5.6
1932	3.9	6.2	5.7	5.9
1933	5.2	7.1	7.5	6.9
1934	8.7	10.4	11.7	9.7
1935	12.8	12.5	16.2	12.6
1936	15.3	14.4	18.8	16.4
1937	16.0	14.5	19.2	17.7
1938	18.1	14.7	21.9	18.1

Source: Germany, Statistisches Jahrbuch, 1937, p. 607; Germany, Statistisches Jahrbuch, 1939/40, p. 642; U.S.S.R. Council of Ministers, The U.S.S.R. Economy, pp. 63-64.

Table 3

Average annual munitions production, 1935-39

(Billions of 1944 U. S. dollars)

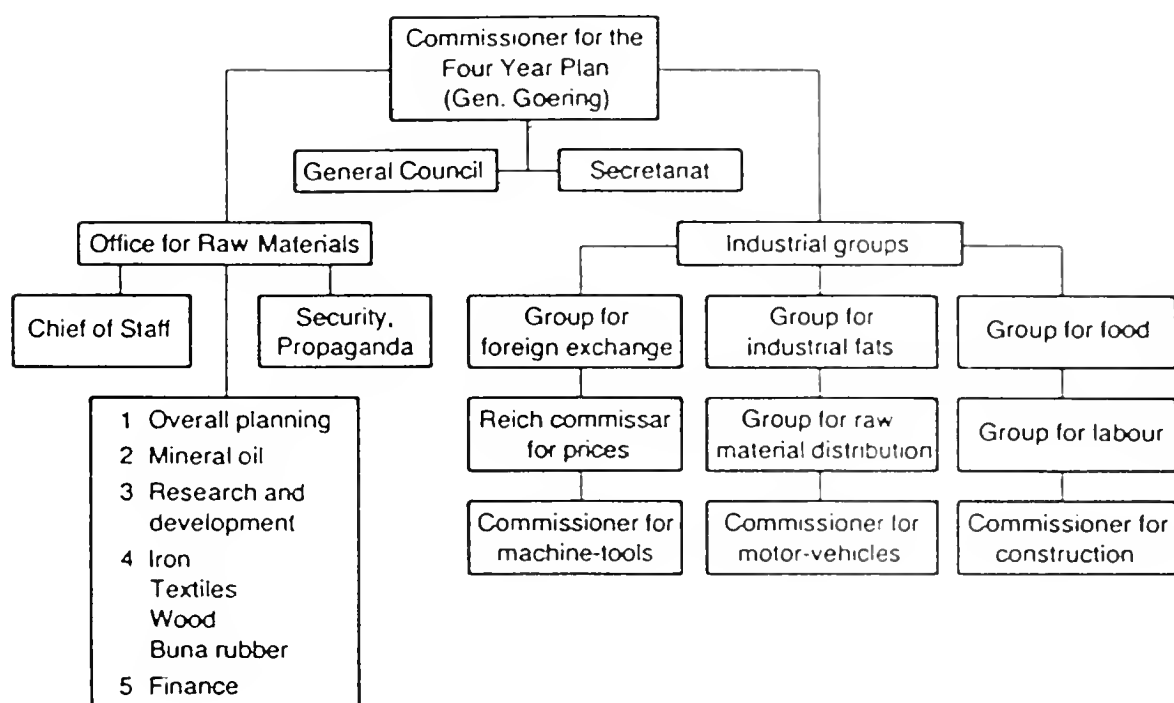
Germany	2.4
U.S.S.R.	1.6
U.K.	0.5
Japan	0.4
U.S.A.	0.3

Source: Harrison, "Resource Mobilization for World War II," Table 1.



Figure 1

The Organization of the Four Year Plan



Source: Overy, Goering, p. 58.

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